

Mayer Wave relates to a low frequency variation in blood pressure, heart rate, and/or vaso constriction.

The Mayer Wave has particular significance for diagnostic and patient monitoring purposes. In particular, the amplitude and frequency of the Mayer Wave are seen to change in connection with hypertension, sudden cardiac death, ventricular tachycardia, coronary artery disease, myocardial infarction, heart failure, diabetes, and autonomic neuropathy and after heart transplantation. The present invention is based, in part, on the recognition that effects related to the Mayer Wave can be monitored based on analyzing a pleth to obtain physiological parameter information. In particular, it is expected that the Mayer Wave influences heart rate (and related parameters such as variations in blood pressure and blood volume) by direct influence on the vaso motor center. A pleth signal can be processed to monitor heart rate and variations therein, thus yielding diagnostic information related to the Mayer Wave. Alternatively or additionally, the pleth signal can be processed to monitor blood volume variations to obtain similar information related to the Mayer Wave.

A difficulty associated with obtaining physiological parameter information based on the Mayer Wave relates to distinguishing the effects associated with the Mayer Wave from effects associated with the above-noted respiration wave, particularly in view of the fact that each of these waves can occur within overlapping frequency ranges. There are a number of ways in which the Mayer Wave and the respiration wave can be distinguished, as described in detail in U.S. Patent Application Serial No. ^{10/720950} ~~(not yet assigned)~~, entitled "Monitoring Physiological Parameters Based on Variations in a Photoplethysmographic Signal", filed concurrently herewith. It has been recognized that the spectral composition or frequency band of the Mayer Wave can be readily characterized and the Mayer Wave can conveniently be analyzed, for purposes of monitoring related blood volume and heart rate variations, by controlling or having the patient control his respiration rate to be outside of the Mayer Wave frequency band under analysis.